

**ABSTRACT**

A combination mass transfer and pump apparatus, which in a single step actively mixes a first mass and a second mass and simultaneously pumps one of the first mass and the second mass through the apparatus. The combination mass transfer and pump apparatus substantially comprises a housing and at least one distributor element having a plurality of selectively fluid-permeable membrane elements wherein the at least one distributor element is agitated within the second mass such that the first mass diffuses across the selectively fluid-permeable membrane elements, mixing with the second mass, and in the same step the second mass is pumped through the housing.